**Attitudes towards human enhancement: a cross-cultural study on Indian, Malaysian and Russian medical students studying in Russia**

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**Abstract**

This article presents findings on attitudes towards human enhancement based on a survey of high school medical students of Indian, Malaysian and Russian origin studying in Russia. The most significant findings included firstly, the identification of the specifics of academic doping and secondly, the effectiveness of prohibitions imposed by Russia on medicinal enhancers. In addition, the survey confirmed the concept of "lookism" and exposed the differences in attitude towards development of different directions of biotechnological enhancement prospects. Cross-cultural studies show great potential in promoting discussions, understanding the enhancement problem specifics in different countries, and sharing practical experience in legal regulation.

**Keywords**

human enhancement, cognitive enhancement, cross-cultural study, "lookism", cosmetic surgery, biotechnological enhancement prospects

**1. Introduction**

In recent decades human enhancement is a widely researched topic in the field of bioethics. Extensive work has been done to examine the opinions of doctors, students and members of society regarding various aspects of this theme. In particular, the problem of cognitive enhancement has been studied by various authors across numerous countries (Ott and Biller-Andorno 2014; Schelle et al. 2015; Forlini et al. 2015). In 2015, the Scientific Foundation of Russia launched a comprehensive study of the human enhancement problem in a project titled "Humanitarian Analysis of Biotechnological Projects of Human Enhancement".

The present study was carried out within the framework of the abovementioned project. The survey was aimed at comparing the attitudes of second-year medical students towards the human enhancement problem. The study group comprised medical students from India, Malaysia and Russia who were studying at (a) the Russian National Research University, Moscow, Russia, and (b) Kursk State Medical University, Kursk, Russia. A total of 168 students (56 from each country) answered questionnaires. Total confidentiality was maintained throughout the study.

Results revealed the extent of knowledge among students in the following areas: (a) the problems of human enhancement; (b) their attitude towards cognitive enhancement and doping in sports, and (c) opinions about the prospects of firstly, new technologies for transferring consciousness to electronic media and secondly, development of these new technologies in the context of justice. Analysis of students' answers allowed the identification of the specifics of human enhancement in Russia.

**2. Methodology**

A cross-cultural survey was conducted on 168 second-year medical students studying in 2 Russian-based institutions namely, the Pirigov Russian National Medical University, Moscow, Russian Federation and the Kursk State Medical University Kursk, Russian Federation. The group comprised 56 students each from 3 countries (India, Malaysia and Russia). The survey was conducted during the period December 2016 - March 2017. Participants were fully informed of the research objectives and assured of confidentiality of data. The opinion poll was voluntary and anonymous.

***3.* Results**

The survey results revealed that more than half of all the interviewed students (32 (57.1%) students from India; 33 (58.9%) students from Malaysia and 33 (58.9%) from Russia) were already aware of the human enhancement issue.

* **Doping**

More than half of the students from Russia (37 or 66.1%) believed that the use of "academic doping" is permissible whereas the number was smaller for Malaysia (13 or 23.2%) as well as India (7 or 12.5%). 26.8% of Russian students and 5.4% of Malayans were found to use medicines for improving cognitive function before tests and exams but Indian students did not use medicines. The following medications were cited: nootropics (8), Mildronate (3), Glycine and Tenotene. In addition, 22 (39.3%) from Malaysia, 16 (28.6%) Russian students and 5 (8.9%) students from India named strong tea and coffee as promoters of increased attention span in the evenings.

An absolute majority of respondents from all three countries (47 (83.9%) from India, 42 (75%) from Malaysia and 48 (85.7%) Russian students) spoke in favor of the need to ban doping in sports. At the same time, 5 (8.9%) of the respondents from India, 8 (14.3%) from Malaysia and only 2 (3.6%) from Russia felt it necessary to prohibit only genetic doping, as it is likely to be used in the future. 8 (14.3%) Malaysian students, 6 (10.7%) Russian students and 4 (7.1%) Indian students expressed the opinion that it would be senseless to prohibit doping in sports.

* **Cosmetic surgery**

The question pertaining to reasons for cosmetic surgery (with the exception of therapy cases) elicited the most attention from students of Malaysia who came up with more than one reason. The most popular reason was quoted as the desire to look more beautiful and attractive (80.4%); low self-esteem (55.4%) was the second reason, and the third was for following fashion and beauty standards (50%). Russian students also showed similar choices: 38 (67%) assigned first place for the desire to look more beautiful and attractive; 27 (48.2%) ranked low self-esteem as second and 17 (30.4%) gave third place to fashion and beauty standards. 38 Indian students (67.9%) were in agreement with the Russian students in choosing the desire to look more beautiful and attractive as the first reason for contacting a cosmetic surgeon. The second reason however, was selected by 17 (30.4%) Indians as following of fashion and beauty standards, and third place was assigned to understated self-esteem by 16 (28.6%) Indian respondents. In response to this particular question although there was scope for writing down own answers, only 6 respondents mentioned other causes such as trauma and the influence of other people. The former still does not matter in this context although it may be controversial.

* **New areas of research**

With respect to the prospects of new areas of research development and technologies, (particularly extension projects), the responses were as follows: more than half of Indian students (41 or 73.2%) supported the development of new techno-scientific directions, and projects in particular, for the extension of human life, and believed that it is fair to spend money on them even under conditions of limited health resources. Approximately half of Malaysian and Russian students (26 (46.4%) and 24 (42.9%) respectively), believed that it is possible to spend money on projects to extend a person's lifespan, even considering that there is a wide spectrum of diseases that has neither been investigated nor has any proven method of treatment.

The opinion of a third of all respondents regarding the possibility of transferring a person's consciousness to electronic carriers is still unreal rather, even fantastic. In general, some students (23 (41.1%) from India, 20 (35.7%) from Malaysia and 22 (39.3%) Russians) do not support the development of such projects.

According to 21 (37.5%) students from India, research in the field of neurocomputer interfaces and the exchange of information between the brain and the electronic device is more of a fantasy than reality. This opinion was shared by 9 (16.1%) Russians and 9 (16.1%) students from Malaysia. Half the students from Russia were convinced that development should be done only for medicine; 18 (32.1%) respondents from Malaysia and 16 (28.6%) respondents from India supported this opinion.

**4. Discussion**

No significant differences were found with regard to human enhancement, and this may be justified by socio-cultural factors. However, given the small sample of students, some features, (which were limited to the smallest number of students of one of the groups), are summed up below.

**4.1. Doping**

First of all, the results of the research are important for understanding the specifics of human enhancement in Russia and in particular, the attitude towards academic doping. Methylphenidate (Ritalin), amphetamine (Adderol consisting of amphetamine salts) are prohibited, and modafinil (Provigil) is severely restricted in Russia. The results of our survey confirmed that the ban is not only successful, but also determines the specifics of cognitive enhancement issues in Russia. Thus one can question the assertion that the prohibitions of cognitive enhancement will not produce desired results.

As stated by M. Lamkin (2012:348-349): "Framing cognitive enhancement as a form of cheating is attractive because it lends itself to an obvious and relatively straightforward policy response: restricting access to these drugs. But although novel technologies can provide new opportunities to engage in troubling practices, it is our prevailing cultural values that motivate people to use technology in problematic ways. Accordingly, while restricting access to enhancements may appear to be an easy fix, it is unlikely to be an effective one".

Not one student named Ritalin, Adderall and Provigil or their analogs as instruments for academic doping. Substances referred to as a means of academic doping included vitamins, energy drinks and the following medicines: nootropics (Fenotropil, Piracetam and Glycine) and Mildronate, which are taken only by Russian students. Thus, the issue in question is the relevance of discussions about human enhancement in Russia and the countries which permit the use of Ritalin, Provigil and Adderall.

* ***Phenotropil***

One of the most popular drugs *Phenotropil* (Phenylpiracetam) was developed as a new generation stimulant that can increase mental and physical performance of astronauts in various stages of space flights of different duration. This medicine increases the speed of taking the right decisions even under extreme conditions without compromising on the accuracy of operator performance. However, it was recognized as “an obsolete medicine” with unproven effectiveness in 2007 (Resolution). Large-scale clinical trials on "Phenotropil" were not conducted and the World Doping Agency included it in the list of products that are banned during competitions.

* ***Piracetam***

Piracetam (2-oxo-pyrrolidone) was developed in the mid-1960s by UCB Belgium pharmaceutical company and was originally used to treat motion sickness. The period between 1968 and 1972 witnessed an "explosion" in research on Piracetam. It was discovered that this drug had the ability to facilitate learning, prevent hypoxia-induced amnesia and electroshock, and return EEG to normal in animals that had undergone hypoxia. By 1972, 700 papers were published on Piracetam (Gouliaev and Senning 1994). Its properties ensured its extremely widespread acceptance for the treatment of various cognitive disorders, including mental conditions arising from hypoxia, intoxication, acute or chronic alcoholism, injuries and various degenerative brain lesions. Systematic reviews of the results of existing clinical studies conducted to date have not however, confirmed the efficacy of Piracetam.

* ***Glycine***

*Glycine* (aminouxusna acid) is prescribed under the following conditions: "reduced mental capacity and emotional stress during exams, conflict and other similar situations". However, the clinical efficacy is not yet proven and therefore it is difficult to talk about its real impact on the human body in general, and on cognitive functions in particular.

It must be noted that in Russia, no drug in the category of nootropic performance enhancers has been tested in healthy people for its effect on attention, memory or other cognitive functions. In fact, there is not a single publication in the "Russian Index of Scientific Citation" database that reflects the current culture and practices of using nootropics as enhancers. On the other hand, such literature exists in Western countries (for example, "The Generation of the Adderall"). In summary, it can be argued that the use of nootropics resembles the field of medical mythology (Vreeman and Carroll 2007), which is relevant to both doctors and the public. This is due to doctors, as the above drugs do not have proven effectiveness in accordance with modern standards of evidence. This is due to public, as patients often refer to Phenotropil as "a pill for cosmonauts"; So, belief that a medicine should be used in space exists and determines the attitude towards it.

* ***Mildronate***

In the present study, two students from the respondent group cited the example of *Mildronate,* which gained notoriety thanks to a series of anti-doping scandals in the arena of sports. According to instructions, it has cardioprotective, antihypoxic, angioprotective, antianginal action. However, the instructions do not contain information on its effect on cognitive functions, but there is such an indication as reduced performance. In fact, Mildronate does not apply to substance use for pharmacological cognitive enhancement. Consequently, it may be relegated to the sphere of medical mythology, especially because of the dramatic increase in its sales in both Russia and Eastern Europe following the scandals in the sports world (Russians are rushing to buy the drug used by Maria Sharapova).

* ***Sports doping***

Research literature often compares academic doping and doping in sports. In a rather ironic manner M.Quigley (2008: 158) asserts that "these two game fields are not the same."The academy and sports work under different sets of rules and have different sets of hopes placed on them”. According to the present survey, the attitude towards doping in sports is more negative in comparison to academic doping. It may be assumed that such an attitude among Russian students can be associated with the extensive media reporting and active discussion of numerous scandals related to sports doping problems by the media. Interestingly, although students from Malaysia and India almost do not experience the influence of Russian media as they are taught in English, they still display the same negative attitude. We would therefore prefer to agree with the opinion of M. Quigley that everyone in general talks about a different understanding of the context of competition.

* 1. **Cosmetic surgery**

Students from Malaysia responded with more number of answers to questions about cosmetic surgery. Many of them associated altered and improved appearance with success in life. The study to some extent confirmed the concept of lookism (discrimination or prejudice due to appearance), according to which the "right" face determines the difference between success and failure (Kim 2003). For example, in South Korea (which is called the world capital of plastic surgery) every fifth woman has already undergone some form of cosmetic surgery (Korean plastic surgery statistics). The number of such people is not only growing in number, but getting younger - adolescents are increasingly visiting cosmetic surgeons and their aspirations are often supported by their parents (Lee, Lim and Yang 2011).

* 1. **Opinions on new research**
* ***Increasing life expectancy***

In comparison to students from other countries, students from India have woken up to the realization that even with limited health resources, it is necessary to support projects which increase the life expectancy of human beings. They are also more convinced that research in the field of neurocomputer interfaces is premature and is more a matter of fiction.

* ***Transfer of consciousness***

At the same time, students expressed doubts similar to the abovementioned ones about the possibility of transferring an individual’s consciousness to an electronic carrier (such as a computer or robot). It is evident that students are the most active part of society in relation to new technologies, but as indicated it is difficult to talk about unequivocal support for certain new areas of science. Obviously, this aspect of the problem requires further research. In particular, it is essential to understand the factors that are taken into account namely, health risks, high development costs, technology viability or others. Moreover, it is necessary to understand the correlation between socio-cultural factors that determine choice and the scientific and technical policies of different countries.

**5. Conclusion**

The present study did not reveal any marked socio-cultural differences in the opinions of students regarding the topic of human enhancement.  Approximately half of the students from the three countries were aware of this issue even before the initiation of the survey. The study threw light on the specifics of academic doping in Russia, showed the effectiveness of prohibitions of medicinal improvers, confirmed the concept of "lookism" and revealed differences in attitude towards the prospects of development of various directions of biotechnological human enhancement. Study results also indicated that the process of comparative studies needs to be continuous in order to be meaningful and assume theoretical importance for the mutual enrichment of discussions and for the exchange of practical experience in regulating certain types of enhancement in different countries.

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